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(57) Abstract

Targeted ligand–liposome–therapeutic molecule complexes (vectors) for the systemic delivery of the therapeutic molecule to various target cell types including cancer cells such as squamous cell carcinoma of the head and neck, breast and prostate tumors. The preferred ligands, folate and transferrin, target the liposome complex and facilitate transient gene transfection. The systemic delivery of complexes containing DNA encoding wild–type p53 to established mouse xenografts markedly sensitized the tumors to radiotherapy and chemotherapy. The combination of systemic p53 gene therapy and conventional radiotherapy or chemotherapy resulted in total tumor regression and long term inhibition of recurrence. This cell–specific delivery system was also used *in vivo* to successfully deliver, via intravenous administration, small DNA molecules (oligonucleotides) resulting in chemosensitivity and xenograft growth inhibition. Other therapeutic molecules, including intact viruses, can be encapsulated in a complex and targeted in accordance with the invention.